Marco

Installation & User Guide

V5.3

This manual is revision A

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Quantel

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Overview & Installation

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What is Marco?

Marco is a software product from Quantel that can be installed on a customer supplied PC. It is an SD/HD compressed field editor, and includes comprehensive editing and effects tools. An effects option provides sophisticated DVE, keying and color tools. It allows locally and remotely held video and audio clips to be edited. It is principally intended for news applications where a location editor is required.

Raw content is typically provided from cameras and other local file-based sources. Marco can also access and download media from Enterprise sQ systems using QTube technology over LAN and standard internet connections via the integrated QTube Browser. When returning from the field it can deliver the results and rushes right back into the Enterprise sQ System via a LAN.

It supports HDSDI/HDMI playback through the AJA T-TAP connector via any Thunderbolt connection so that broadcast quality video can be viewed or uplinked whenever required.

Marco uses NVIDIA CUDA GPU processing to deliver maximum realtime performance and the comprehensive camera file format support allows instant access to media for editing.

The Marco software can be installed on a customer supplied PC of the specification stated in this guide.

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Installation Requirements

Download GenQ Software, Drivers & User Info

To download additional user guides and drivers open a browser and go to:

http://www1.quantel.co.uk/public/wbsr2.nsf/pubindex/MarcoUtilities?OpenDocument

To download Marco software open a browser and go to:

http://www1.quantel.co.uk/public/wbsr2.nsf/pubindex/MarcoLatest?OpenDocument

Minimum PC Specification

For Marco software to operate correctly, you need to have a PC that matches or exceeds the specifications below:

Processor	Intel Core i7 processor. 3rd generation (Ivy Bridge) or 4th Generation (Haswell). 2.4GHz minimum clock speed, 6MB minimum cache.
Memory	8GB DDR3 1600MHz minimum, 16GB preferred.
Graphics Card	NVIDIA CUDA Graphics Card required. NVIDIA Quadro K1100M, GT750M, GT640M with 1GB of memory or better.
Display	1920 x 1080 or better for optimum viewing performance.
Sound Card	Windows 7 compatible sound card.
Disk Drive	Use of a Solid State Disk Drive is recommended. Minimum size 500GB or 7200rpm 500GB Hard Drive with additional 2nd disk drive USB connected.
Ports & Interfaces	USB3 Ports recommended for external disk drive connections. Thunderbolt I/O port required for use with AJA T-TAP.
Operating System	Microsoft Windows 7 Professional 64-bit.
Networking	1000BASE-T Ethernet.
Keyboard/Mouse	Standard Windows compatible keyboard and mouse.

External monitoring

Marco uses the AJA T-TAP device to provide external monitoring. This is not provided as standard and needs to be acquired by the customer. For more information about the AJA T-TAP device and to purchase, go to the following link:

http://www.aja.com/en/products/t-tap

Note that a Thunderbolt cable also needs to be acquired in order to connect the T-TAP device. These can be purchased from any Apple reseller.

Additional Specification Notes:

Processor

It is recommended that the processor used on the Marco PC is Intel Core i7 4th Generation (Haswell) or 3rd Generation (Ivy Bridge). At the time of writing suitable CPUs are:

- i7-4700MQ, 4700HQ, 4750HQ, 4800MQ, 4850HQ
- i7-3630QM, 3720QM, 3740QM, 3820QM, 3840QM, 3920QM

All 3 and 4 series processors that end in U (eg 3667U) are low power CPUs and are about half the speed of the recommended processors. These are NOT recommended for use with Marco software.

Memory

Marco is a full 64-bit application and makes extensive use of memory when rendering multilayer timelines and effects processes etc. While 8GB is the minimum recommended specification, 16GB can help improve performance.

Graphics

For smooth playback and efficient rendering of effects, an NVIDIA CUDA Graphics card running the latest available NVIDIA drivers is required. Any CUDA enabled graphics card improves performance. For the best performance, the K1100M or GT750M or better are recommended.

Disk Drive

The disk drive(s) fitted, ultimately govern the playback performance of the edit timeline. Use of an SSD is recommended for best performance. For the best performance on a single disk drive a large, fast SSD drive is essential.

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If an SSD is not available, it is necessary to configure Marco to utilise a second, USB-connected, disk drive to hold the video workspace. This external drive can also be used to store native camera files such as P2, XDCAM, GoPro, etc. in separate folders. In this configuration, the System files and audio are held on the internal drive. Splitting the audio and video partitions onto separate disks improves the playback performance.

USB2 connected drives are limited to a theoretical maximum performance of 480Mbps. However, this figure is rarely achieved in practice. USB2 restricts performance of jog/shuttle functions and when previewing multi-layer timelines and is not recommended. USB3, now available on many disks and laptops, removes this restriction.

Use of the 'soft-mount' facility within Marco to mount native files on USB connected media and edit directly from these on to the timeline is an efficient workflow that should be used where possible.

Drive Capacity

Sufficient drive space is required to install and run the Marco software. A minimum of 8GB drive space is recommended for the install and log usage. Marco also requires local storage to be assigned for both Video and Audio workspace. This is used by the editing timeline as well as by the local clip library within the Marco software. To improve management efficiency and reduce file fragmentation, it is recommended to have the workspace on a separate partition.

Audio: 24GB of space provides storage for approximately 8 hours of 4 channel audio or 4 hours of 8 channel audio.

Video: 51GB provides space for approximately 1 Hour of HD 100Mbit data and 2 Hours of SD IMX or DVCPro data. 128GB provides in excess of two hours of HD compressed video storage.

To improve overall performance during playback, it is recommended to place video and audio partitions on separate drives.

Supported formats

- XDCAM IMX 30/40/50 Mbit/s
- DV, DVCPRO, DVCPRO 50
- DVCPRO HD
- XDCAM HD 18/25/35/50 Mbit/s
- AVC-intra 50/100 Mbit/s
- GoPro Hero 2
- AVCHD/PCM audio
- MPEG2 HD 4:2:2 (JVC/Canon)

Download & Install Quantel Software

Download Marco Software

To download the Marco software do the following.

1 Open a web browser and open the following link

http://www1.quantel.co.uk/public/wbsr2.nsf/pubindex/MarcoLatest?OpenDocument

Resource	Release	Size	Download
Marco S5.3 rev 5.035 part 0.qpd	19/11/2013	244.06MB	
Marco S5.3 rev 5.035 part 1.qpd	19/11/2013	242.82MB	
Marco S5.3 rev 5.035 part 2.qpd	19/11/2013	192.45MB	
Marco S5.3 rev 5.035 setup.exe	19/11/2013	46.33MB	
Marco S5.3 rev 5.035 checksums.txt	19/11/2013	0MB	
Utilities	19/11/2013		

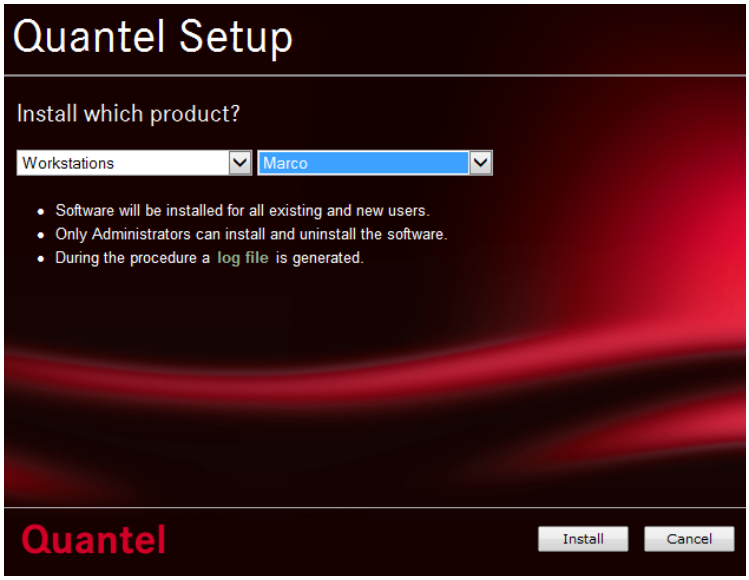
2 The Marco software consists of one **setup.exe** file, three **.qpd** files and one **.txt** file. Download all these files (they must all be kept in the same directory).

Install the Software

To install the Quantel software, do the following:

1 Right-click the downloaded Marco setup.exe file and select **run as administrator**.

The Quantel installer window now appears.



After a few moments the Quantel Setup window appears.

2 Select **Workstations** from the left drop-down box and **Marco** from the right drop-down box and press **Install** in the bottom-right of the window.

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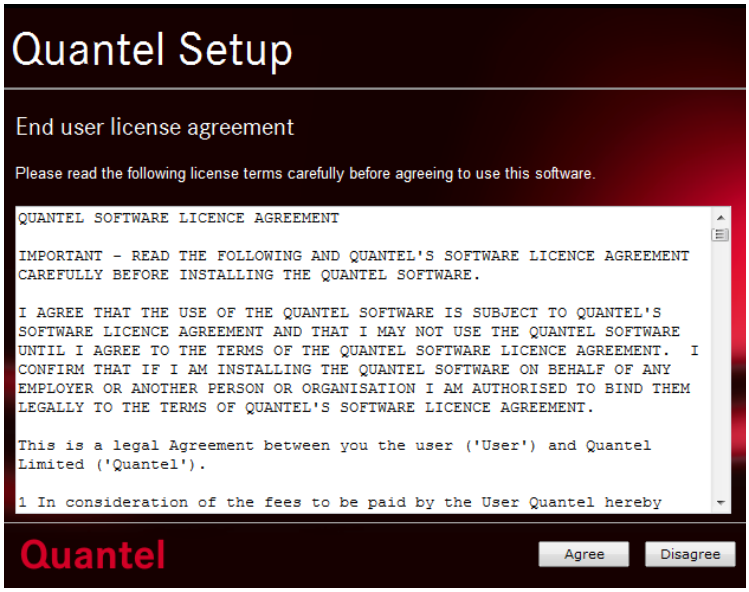


The end user license agreement then appears.

3 Read this carefully and then press **Agree** to accept the license agreement.

The software now installs.

When the software has finished installing, a window appears stating that installation is complete.

4 Tick **create shortcut on the desktop** and then press **OK** in the bottom-right of the window.

Install the License

Before running the software for the first time, the license needs to be installed. When the Marco software is purchased, you have a choice of licensing against a USB dongle or your PC/laptop Disk ID.

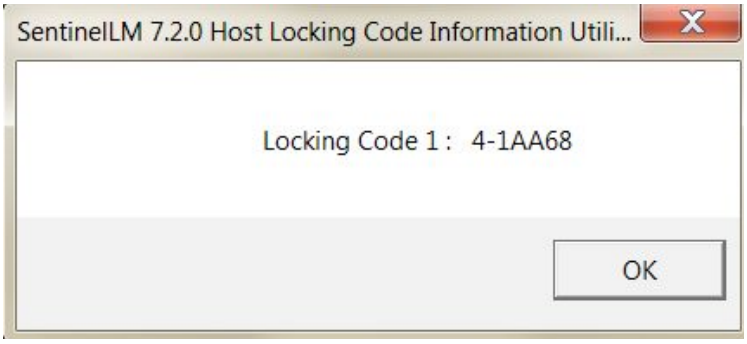
Obtain License using Disk ID

To enable your licensing request against a PC/laptop Disk ID, do the following:

1 Download the V2 Locking Code Generator from the following address:

http://www1.quantel.co.uk/public/wbsr2.nsf/pubindex/MarcoUtilities?OpenDocument

2 Run the self-extracting locking code generator and allow it to unzip into the default directory.



3 Navigate to **C:\Data\Utilities\EchoID** and run the **echoid32.exe**. This generates a 6 digit locking code against your Disk ID similar to the screenshot.

4 E-mail this code to **licences@quantel.com** quoting your order number and allow one working day for your license to be created and emailed to you.

5 When you have received the license install it using the steps below.

Install License

Whether you chose to have the license sent to you with a USB dongle as part of the Marco purchase or if it was emailed to you using the steps above, do the following to install the license file:

1 In Windows, create the directory **C:\Data\Licenses**.

Note that 'licenses' must be spelt like this in order for it to be correctly located by the software.

2 Place the supplied **lservrc.lic** license file in this directory.

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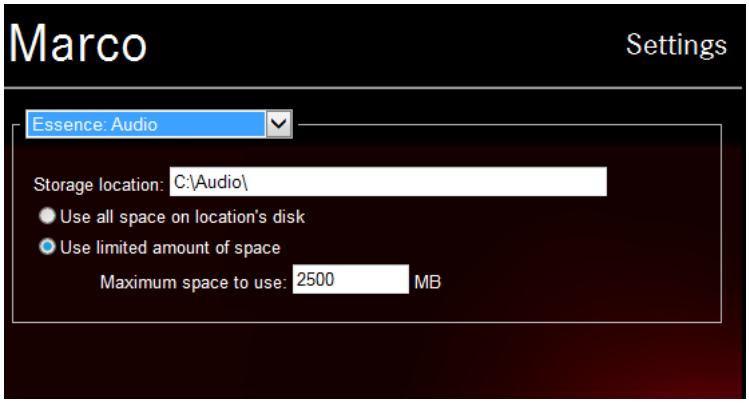
Quantel Settings

After installing the license, settings must be configured in the Quantel Settings menu. Note that some settings are not described here. These are optional, depending on user preference.

1 In Windows, navigate to: **Start – All Programs – Quantel – Marco V# – Settings**.

2 Right-click **Settings** then select **run as administrator**.

Essence: Audio

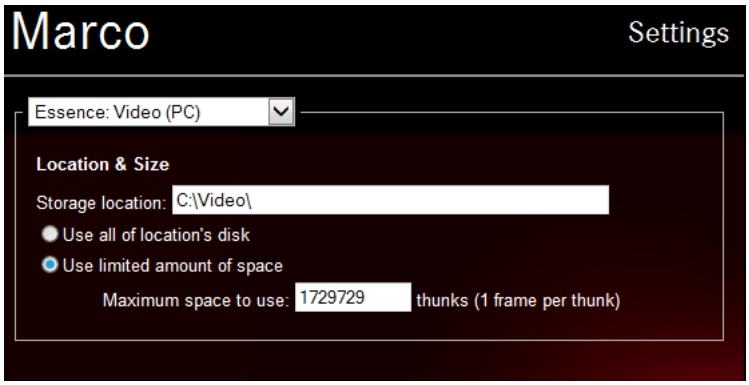


1 From the top-left drop-down box, select **Essence: Audio**.

2 Tick **Use limited amount of space**. A default maximum space to use is assigned.

3 (Optional) Assign a sensible maximum number of MBs to be used for audio storage. For example, 24GB of space provides storage for approximately 8 hours of 4 channel audio or 4 hours of 8 channel audio. This would require approximately 24576 MB to be allocated for audio storage.

Essence: Video

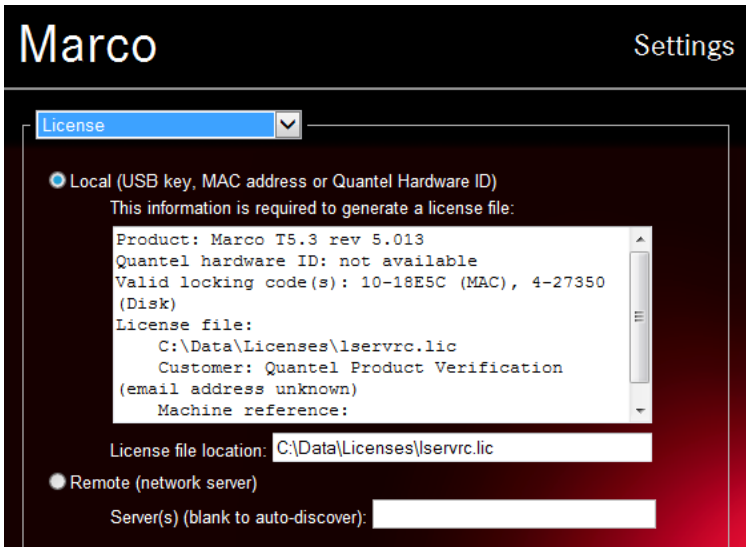


1 From the top-left drop-down box, select **Essence: Video (PC)**.

2 Tick **Use limited amount of space.** A default maximum space to use is assigned.

3 (Optional) Assign a sensible maximum number of thunks to be used for video storage. For example, 51GB provides space for approximately 1 Hour of HD 100Mbit data and 2 Hours of SD IMX or DVCPro data. 128GB provides in excess of two hours of HD compressed Video storage. This would require approximately 361333 thunks to be allocated for video storage.

License



1 From the top-left drop-down box, select **License**.

2 Select the **Local** button.

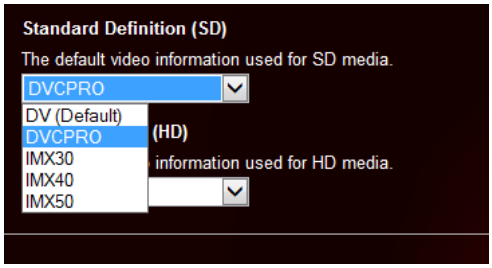
3 Check that the **License file location** path is **C:\Data\Licenses\lservrc.lic**.

Video Information

All media is sorted on disk at 1920 x 1080, in the compression format selected in the Settings menu. The compression format on disk also affects realtime playback performance. The higher the compression format then the easier the media is to playback.

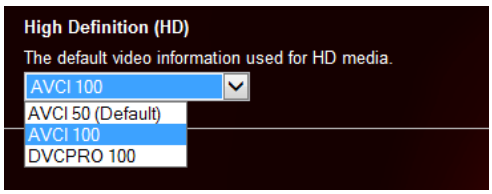
1 From the top-left drop-down box, select Video Information.

2 Select the compression format to be used for SD media. Choices available are as follows:



- DV (Default)
- DVCPRO
- IMX30
- IMX40
- IMX50

3 Select the compression format to be used for HD media. Choices available are as follows:



- AVCI 50 (Default)
- AVCI 100
- DVCPRO 100

4 Press **OK** to action all the changes and exit the Settings window.

720P 50/60 is not compatible with encoding to the DVCPRO 100 storage settings. If working with 720P material then select the HD video storage to be AVCi 50/100.

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Installing AJA T-TAP

If a video output, other than the UI, is required then an AJA T-TAP may be purchased and installed on any free Thunderbolt port.

AJA T-TAP uses a Thunderbolt connection to provide Marco with the bandwidth necessary for full broadcast-quality video and audio output. The T-TAP connects directly to the Marco workstation via a Thunderbolt cable so a Thunderbolt I/O port is required on the Marco PC/laptop in order to use the device.

A Thunderbolt cable needs to be purchased separately in order to use the AJA T-TAP device.

The latest T-TAP driver can always be found in the software version path here:

C:\Data\Marco V#.# rev #.#\DLL_Data\Quantel\AVIO3PCardDriver

For installation information and to identify the correct driver to be used, read the T-TAP section in the readme.txt file.

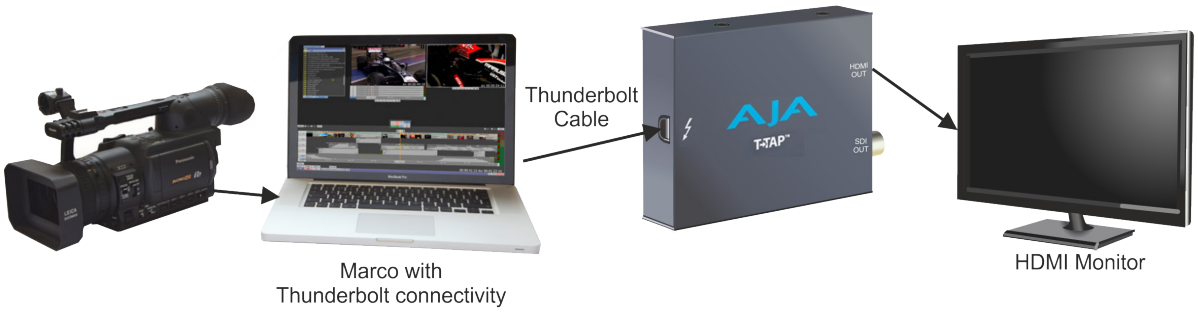
Supported Video Outout Formats

HDMI and 10 bit SDI with up to 8 channels of embedded audio are supported in the formats shown below:

Format Parameters			Video Interface Support	
Size	**Framerate**	**422**	**SDI**	**HDMI**
SD	25, 29.97	422	✓	✓
HD 720	50, 59.94, 60	422	✓	✓
HD 1080	23.98, 24, 25, 29.97, 30	422	✓	✓

Connecting to your Computer

To connect the AJA T-TAP device to your Marco workstation, do the following:

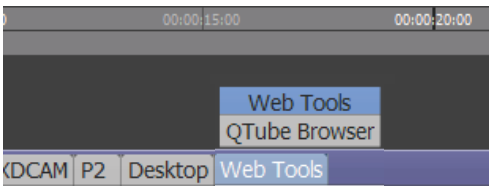


1. Connect the T-TAP Thunderbolt port to your computer using a Thunderbolt cable. T-TAP power is delivered using this cable.
2. Connect an HDMI Video Monitor to the T-TAP HDMI Out connector.

When using T-TAP on a MacBook Pro with bootcamp, Windows does not automatically recognise the T-TAP if you plug it in while Windows is running. You must restart your Macbook. When you restart, the new Thunderbolt device causes Windows to reinstall drivers for about 8 devices (as well as a Thunderbolt controller and the new Thunderbolt device - T-TAP). This may take a few minutes.

Web Tools

The Web Tools feature is intended to provide quick and easy access to web-based applications such as QTube Browser.



Web Tools appears as a tab on the Application Bar. Selecting the **Web Tools** tab displays a list of configured websites. Selecting one of these opens an embedded web browser.

XML Creation

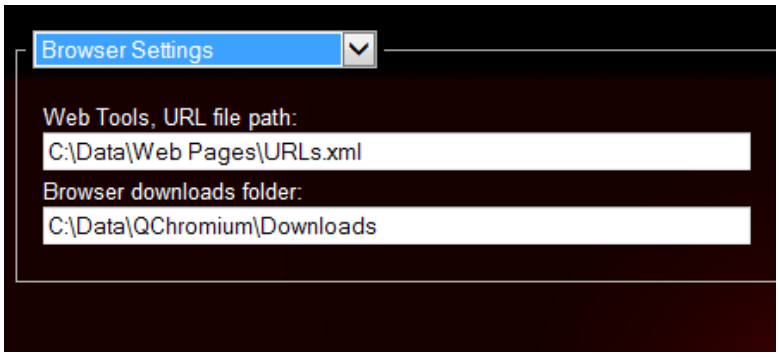
Web Tools provides access to a pre-defined list of URLs – these are defined in an XML file. After the Marco software has been installed, the Web Tools XML file needs to be created and saved in a sensible location. In the Quantel Settings menu you can then specify the path of the Web Tools XML file.

There is an example XML file in the folder **Data\x64\DLL_Data\Quantel\QChromiumEmbedded**. This should be copied to a sensible location and edited to include the required URLs, for example QTube Browser.

Web Tools Set-up

To enable Web Tools on Marco, do the following:

1. On Windows, navigate to: **Start – All Programs – Quantel – Marco V# – Settings**.
2. Right-click **Settings** then select **run as administrator**.
3. Select **Browse Settings** from the drop-down box.
4. Specify the location of the XML file which defines the required URLs.
5. The **Browser downloads folder** setting should be set to the location in which web downloads are to be stored.



For more information about configuring the Web Tools option, contact Quantel support. See 'Help Desk & Web Support' in Appendix B for contact details.

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Deliver to sQ

To connect Marco to an Enterprise sQ System requires a QTube Transformer.

When a LAN connection is available, Marco can use QTube technology to publish material from the Marco to a remote server.

How to Configure

To configure the Deliver to sQ feature, do the following:

1 Open the Quantel Settings menu by pressing Windows **Start – All Programs – Quantel – Marco V# – Settings**. In order to make changes to the settings, you are required to right-click **Settings** then select **run as administrator**.

2 Using the scroll box at the top of the Settings menu, navigate to the **sQ Connection** option.

3 In the **URL** box enter the path to a configured transformer.

4 Select **Apply** to confirm changes and **OK** to exit the Settings menu.

The transformer requires it's 'ISA Zone HTTP paths (comma separated)' to point to a valid ISA and the 'Allocating pool' also needs to be set.

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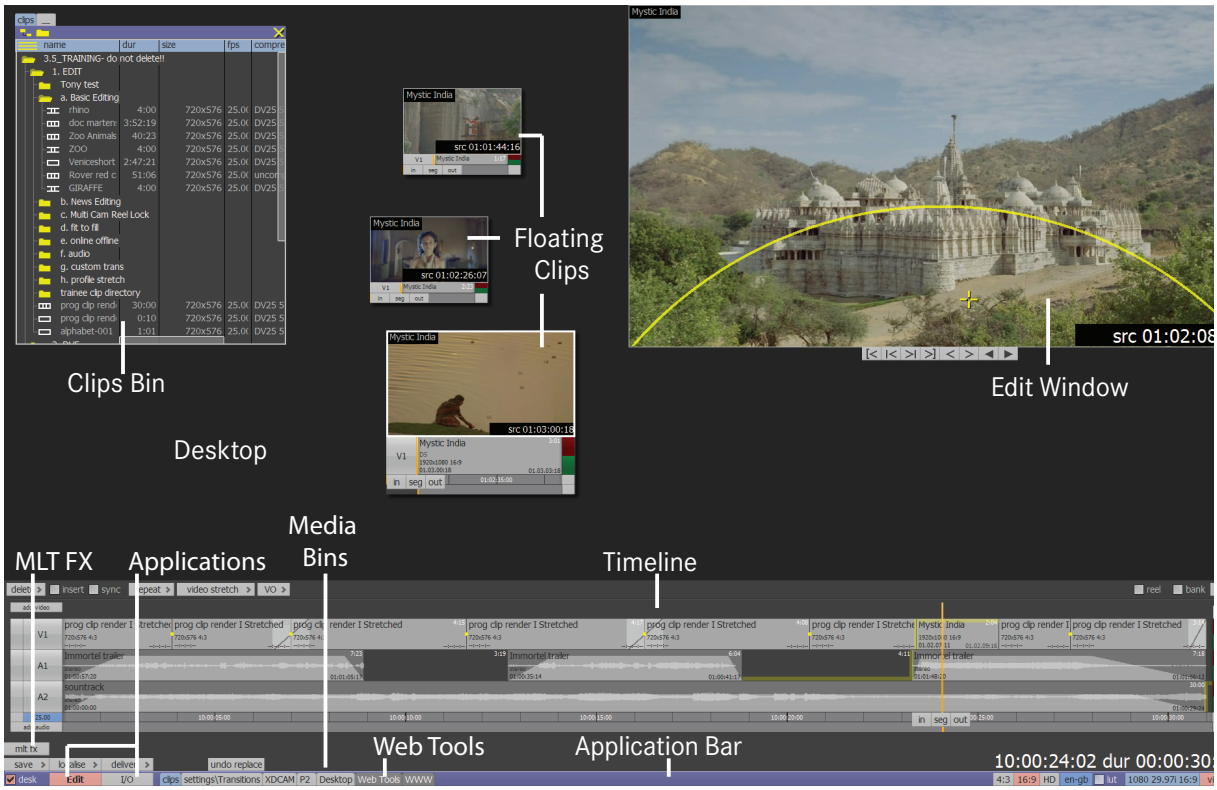
Using Marco

Quantel

Overview

Marco's GUI closely resembles that of the Quantel sQEdit. For those new to the Quantel interface, it is simple and quick to learn, easy to use and includes all the editing and effects tools needed.



Many of the features covered in this chapter are available as standard. Some features covered are additional options, for example MLT FX, Tracker and Web Tools.

Please see the corresponding User Guides for more in depth detail of the features covered.

Desktop Editing User Guide

Timeline Editing User Guide

MLT FX User Guide

MLT FX Tracker Function User Guide

Audio Editing User Guide

Media Bins User Guide

I/O User Guide

QTube Installation & User Guide

Key Features

- Marco runs on standard laptops (see Chapter 1 for minimum specifications).
- It uses NVIDIA CUDA GPU for great interactive performance.
- It includes Edit and I/O modules (MLT FX and Mocha Tracker are optional).
- Marco contains 'One-shot' video fixing tools: video correction, white balance, single point tracker, size/position.
- SDI video output is possible via the AJA T-TAP.

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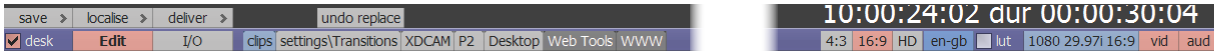
- Marco offers a choice of on disk compression: DVCPRO 100, AVCi 50 or AVCi 100 for HD. DV, DVCPRO, IMX 30, IMX 40 or IMX 50 for SD.
- It can retrieve media from any Enterprise sQ system via integrated QTube Browser (requires QTube Transformer).
- It can deliver flattened MXF files to any Enterprise sQ system when connected to a LAN (requires QTube Transformer).

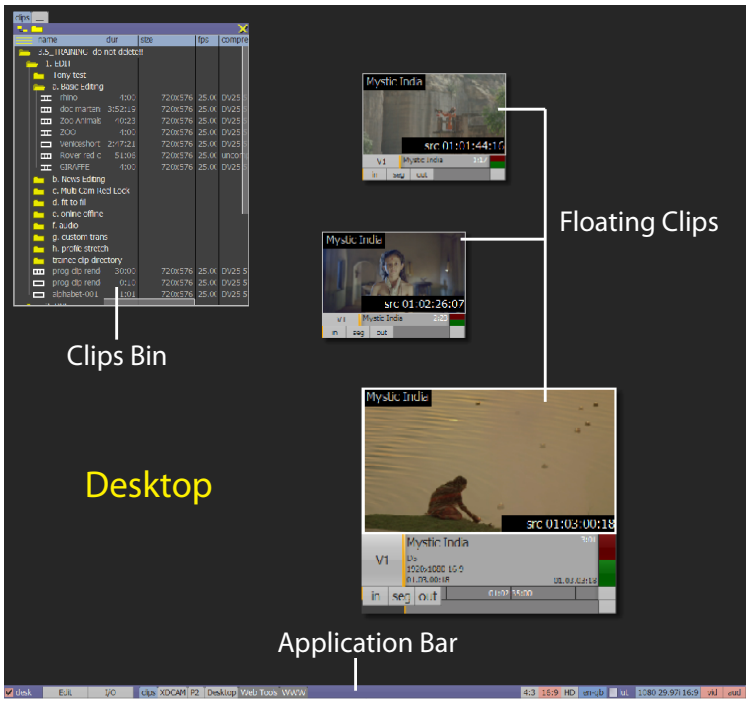
User Interface

Application Bar

The Application Bar runs along the bottom of the interface and displays the available applications, media bins, Web Tools and output formats (where applicable).



The Desktop



The desktop provides a blank area that can be used to preview material, mark 'in' and 'out' points and assemble shots. You don't have to have an application open to use the desktop.

Clips can be taken from any bin and placed directly onto the desktop area. Clips placed on the desktop are referred to as Floating Clips. They can be assembled into sequences, dropped into another application, or saved back to the Clips Bin.

Each Floating Clip provides its own set of options that can be found by hovering the cursor outside the top-right corner of the clip and selecting the **more** tab that appears.

The ‘More’ Menu

The **more** menu includes the following functions:

Option	Description
Edit	The **edit** function places the selected clip or clip segment onto the Edit Application timeline at the current timeline cursor position.
Replace	When the **replace** function is selected it replaces any media on the Edit Application timeline with the current Floating Clip or selected segment.
Swap	The **swap** function swaps the current Floating Clip timeline with the current Edit Application timeline.
Repeat	**Repeat** can be used to create a ‘freeze frame’ effect in an edit by repeating a single frame to the desired duration. It can also be used to repeat a single frame (eg an imported JPG) into a static video.
Localise	The **localise** function imports a copy of a clip in its native video format into the Clips Bin. Clips can be localised to ensure that they are always available if the original server held source material becomes unavailable.
Video Stretch	Floating Clips can be stretched to a new duration in order to fill a gap or to create slow motion and fast motion effects.
Audio Stretch	The audio tracks of any Floating Clip can be stretched to specific video frame rates as a desktop process, eg to accurately convert 24 fps material to 25 fps without changing the audio pitch. The audio stretch process has a number of options available to suit the type of audio material to be stretched and the desired level of accuracy.
Audio Repitch	The audio pitch of any Floating Clip can be raised or lowered using the **audio repitch** (‘Duck Voice’ audio distortion) function to disguise voices. The pitch can be set between 50% (lower pitch) and 200% (higher pitch).
Scene Detect	The **scene detect** function automatically detects a change of scene within a clip. A copy of the original clip is then produced, with edit points (cuts) at the positions where a change of scene has been detected.
Source Order	Clips can be reordered from edit/play order to source/load order by using the **source order** function. Reordering is based on originator and source timecode.
Flatten	The **flatten** function allows you to combine multiple layers on the timeline into a single track, ie ‘flatten’ it.
Commit	The **commit** function also ‘flattens’ any multilayered timelines into a single track. Unlike the **flatten** function, **commit** also removes any edit points creating one single clip rather than a clip with multiple segments.

See the Desktop Editing User Guide for more details about Floating Clips and using the desktop’s functions.

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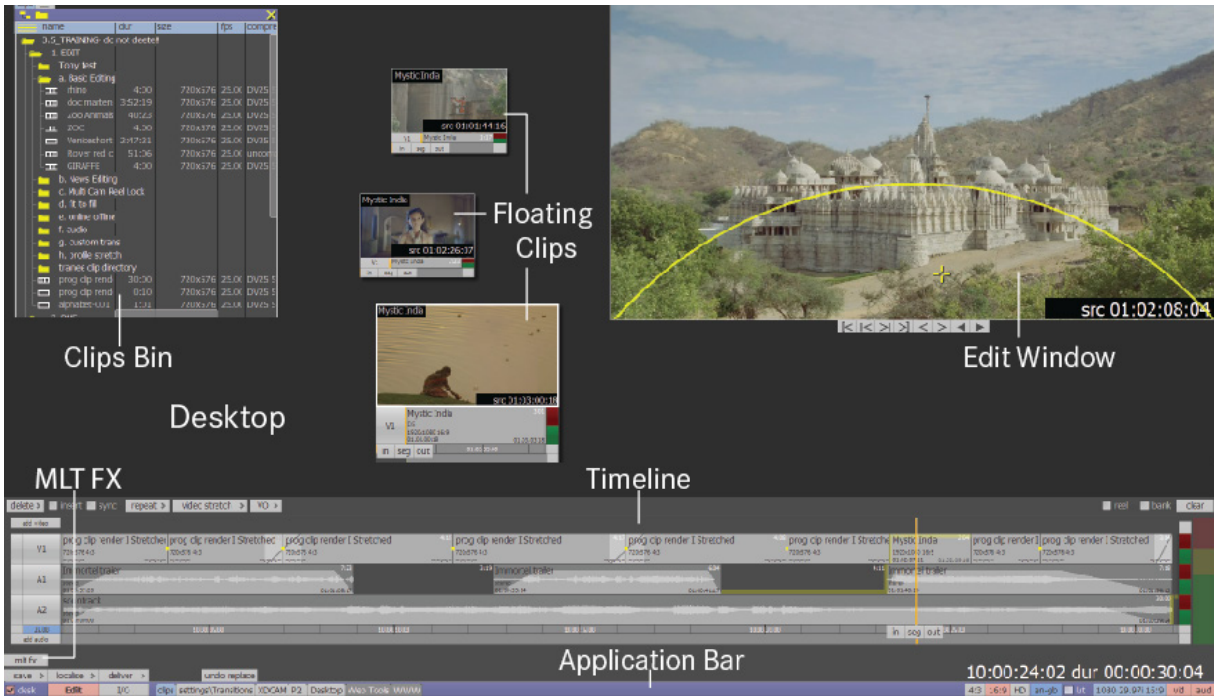
Applications

Edit Application

The Edit Application timeline on Marco can have up to 8 audio tracks on the timeline and up to 32 video tracks. Tracks can be added and deleted as required, although a minimum of one video track remains at all times.

The timeline editor is multi-resolution and supports a wide range of image aspects, pixel shapes, bit depths, colour space and sampling structure. Multiple resolutions and aspects can be combined on one timeline. Mono, Stereo and Quad audio is also supported.



You can use the timeline to assemble clips, create transitions between clips and provide a method of navigating through the whole edit.

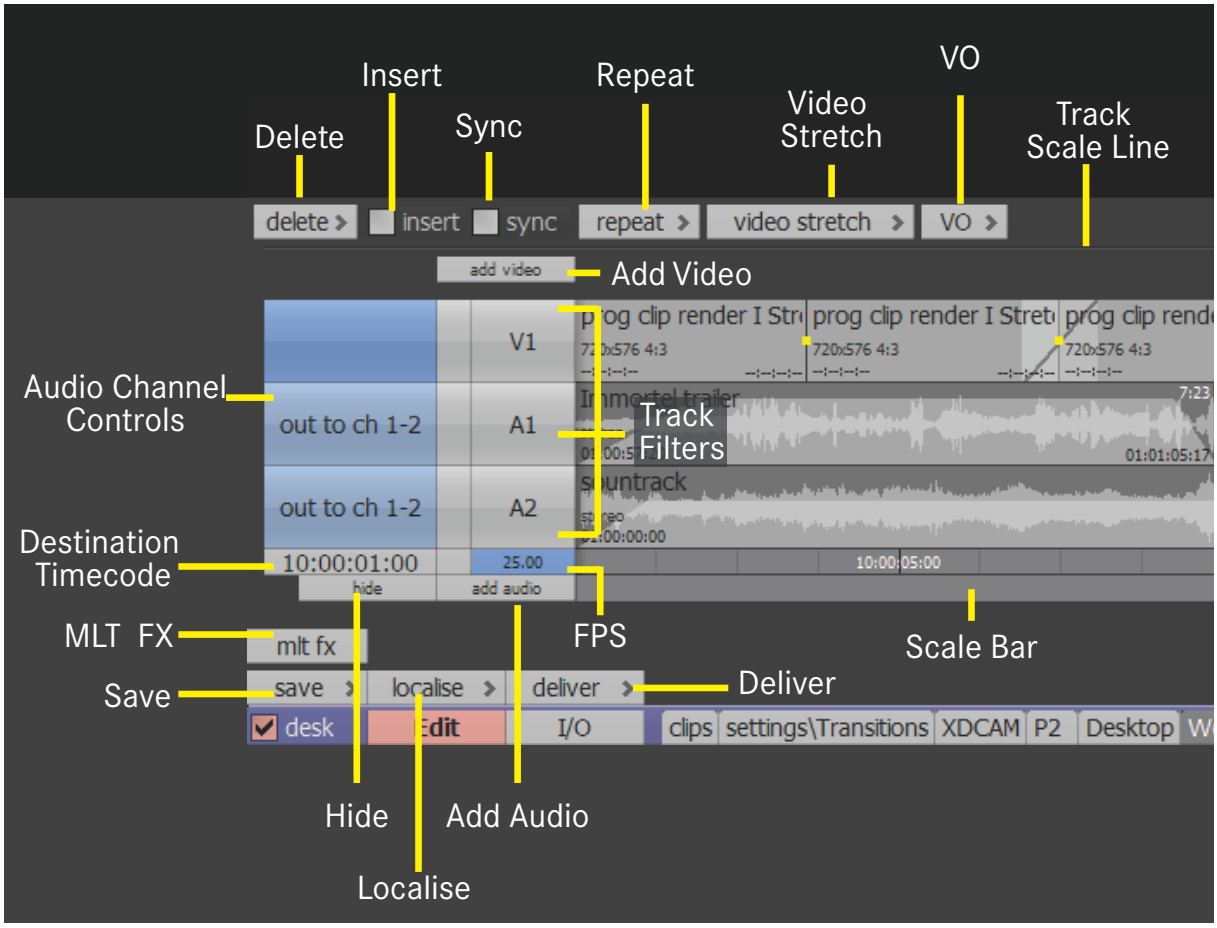
The first clip placed on the timeline determines the initial video format, start timecode and audio track assignments for all the following clips assembled on the timeline. Therefore, the first track needs to include the settings that are required for the whole edit.

The timeline cursor indicates the current frame on the timeline and can be used to navigate through the timeline and set ‘in’ and ‘out’ points to select a section of the of clip.

There are two ‘hidden’ menus contained within the timeline that provide additional tools including audio channel controls and audio level controls.

Timeline Editing Features

You can use Marco's Edit Application to perform the following functions:



- Create a multilayer timeline (MLT) by adding additional video and audio tracks.
- Edit with different media resolutions on the same timeline using Quantel's Multilayer Resolution Co-Existence™ technology.
- Use gestural or keyboard based editing.
- Use Matchframe to quickly find the original source material from an edited clip, even with stretched clips.
- View either source or destination timecode or frame count.
- Multi-level undo and redo.
- Video and audio Fit to Fill editing.
- Use insert, replace and swap edit methods to get clips onto the timeline.
- Single and multi-shot trimming.
- Complex trim across multiple tracks and layers.
- Extend edit to current position.
- Segment highlights for easier identification and navigation.
- Fully automatic management of tail frames with visible indication of tails and duration.
- Automatic unlimited extend of repeated frames.

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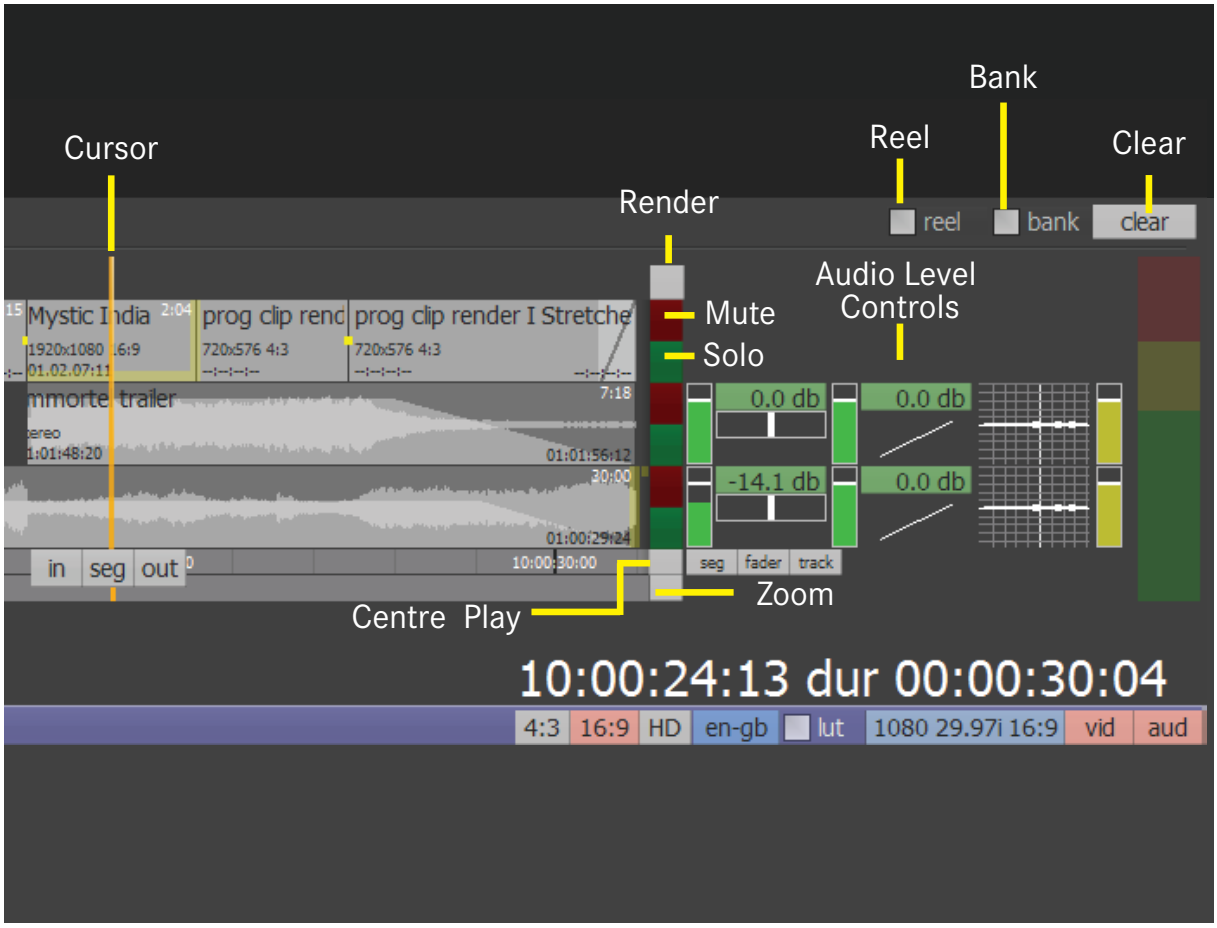

- Audio/video sync display with lock sync trim mode.
- Industry standard keyboard shortcuts.
- Linear or profile video speed changes in timeline or on Desktop.
- Uncommitted edits and transitions.
- Multi-resolution commit of edits.
- Flatten multilayer timelines with a top down view.
- Segment out with or without tails.
- Audio rebuild of transitions after trim or effects changes or for different aspect ration changes.
- Split edits into their component rushes with or without tails.
- Create transitions (ie cuts, wipes, dissolves) between clip segments.
- Apply custom transitions (designed in Quantel's Effects module) that use any effect tool including plug-ins.
- Use the **reel** to edit and reassemble clips on the timeline using a storyboard reel.
- Use the **bank** to store a number of clips to be used later, either on the timeline or loaded into other applications.

- Use **video stretch** to stretch clips to a new duration in order to fill a gap or to create slow motion and fast motion effects.
- Mark in and out points.
- Trim and extend clip segments.
- View either source or destination timecode, or frame count.
- Access a hidden menu by dragging the Track Filter boxes to the right. Access a second hidden menu by dragging the Mute/Solo boxes to the left.
- Perform insert and sync editing using the **insert** and **sync** controls.
- Soft-mount raw media on the timeline: ARRI RAW, Canon RAW, CIN, Cinema DNG, DPX, Go Pro MP4, MXF-wrapped DNxHD, P2, Quicktime ProRes, RED, Sony F65, SStP, TIFF, XAVC and XDCAMHD formats.
- Decode and adjust soft-mounted raw media live on the timeline.
- Frame accurate editing at 25, 29.97, 50, 59.94 fps with appropriate timecode.
- Localise soft-mounted media using the **localise** option.
- Save edits to the Clips Bin using the **save** option (note that **save** does not localise remote media).
- Add logging information to media.
- Record voice-over tracks using the **VO** feature.
- Add templates and graphics to the timeline. Templates need to have been created on an sQEdit or Qube.
- Apply simple 'fix' effects such as **tracker**, **white balance**, **resize** and set **video levels**. Press <F8> to access these effects tools.
- Perform audio monitoring, audio channel mapping, audio levelling, audio keyframing and much more.
- Publish edits to a remote sQ server using the **deliver** feature. Note that this is only possible when an internet connection is available.
- Play out media to an external monitor in order to preview and monitor output quality. Note that this is only possible when the AJA T-TAP device is installed and connected.

See the Timeline Editing User Guide for details on using the Edit Application's functions.

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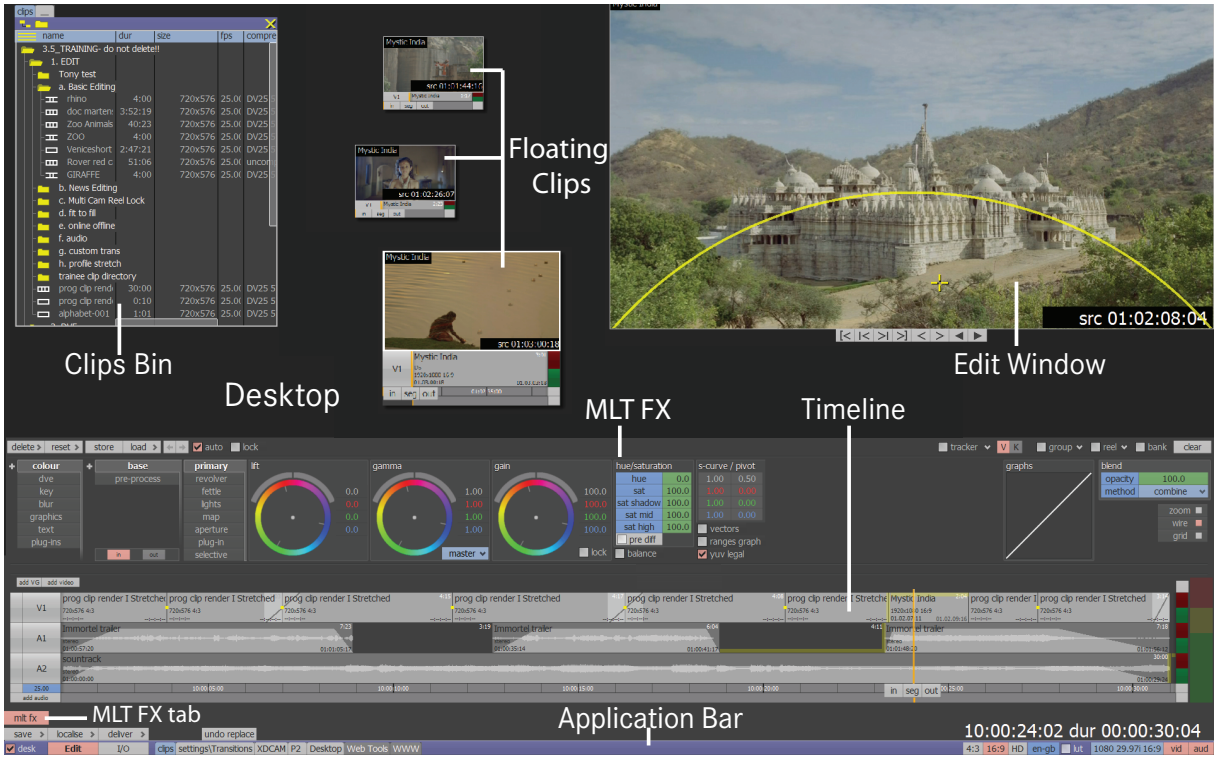
MLT FX (option)

The MLT FX menu is an effects suite embedded directly within the Edit Application. Processes can be easily applied to individual clip segments, whole video tracks or the whole timeline.

Please note that MLT FX is an additional purchase option.

To open the MLT FX menu press the **mlt fx** box in the bottom-left of the Edit Application. You can close the MLT FX menu by pressing **mlt fx** again.



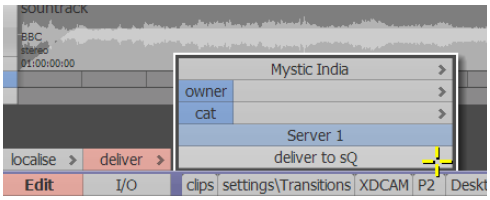
You can use Marco's MLT FX menu to perform the following functions:

- Pre-visualise multiple processes' effects within the timeline environment. Note that play-back performance and render abilities depend on the PC specification; for realtime play-back ensure the PC meets the minimum specification stated in Chapter 1.
- Use the **dve**, **colour**, **key**, **blur**, **graphics**, **text** and **plug-ins** process menus to create effects.
- Use the **colour** grading suite to grade your edit. Tools include: primary colour correction tools, 3D Cube Builder, Stillstore, Storyboard, Revolver, Fettle, Printer Lights, Selective Keys, aperture control, colour ranges control, Inside/Outside grading and much more.
- Add multiple processes and re-order them to create a process hierarchy.
- Use the 'groups' function, to apply effects processes across multiple 'groups' of clips and/or video tracks.
- The **tracker** tool is available as an additional option. This can be used to apply point based or area based tracking information to an effect process.

See the MLT FX User Guide, Grading User Guide and MLT FX Tracker User Guide for details on using these functions.

Deliver to sQ

The Deliver to sQ option provides the ability to publish clips from Marco to a remote server using QTube Transformer technology.



Below the Edit Application timeline there is a **deliver** option. When pressed this displays a menu similar to the publish menu on Quantel sQ Workstations.

You can select the publish area (publish areas are set up in the sQ ISA manager) and modify the clip name, owner and category before pressing **deliver to sQ**.

When the **deliver to sQ** box is selected a flattened MXF version of the edit is sent to the configured Transformer which then publishes the file to the selected remote server. An indication of the publish progress is seen as a progress bar beneath the timeline.

The **deliver** option is always present beneath the timeline in the Edit Application. However, for a publish to be performed, Marco needs to have a LAN connection and needs to be correctly configured in the Quantel Settings menu. If no LAN connection is available a 'not connected' warning message appears when a publish is attempted.

The clip must be rendered first and it must be the same framerate as the server in order to publish successfully.

In order to publish successfully the rendered clip must be at the same framerate as the remote server. Supported frame rates on the timeline for delivery to an Enterprise sQ System are shown in the table below:

	Source Frame Rates Supported			
Server Frame Rates	25	29.97	50	59.94
25 / 50	✓	X	✓	X
29.97 / 59.94	X	✓	X	✓

As Marco natively supports 720P 50 and 59.94 timelines it is possible to deliver these to a 25 and 29.97 fps server interleaving the frames as part of the process.

See the Timeline Editing User Guide for more information about publishing clips to a server.

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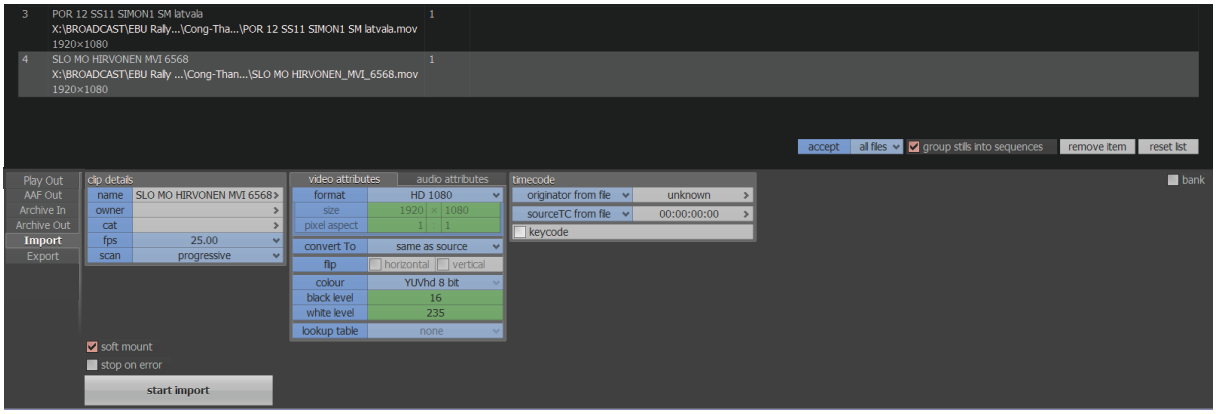
I/O Application

The I/O Application is used to transfer material in and out of Marco's workspace. To access the application, press the **I/O** tab on the Application Bar.

The menu area above the Application Bar provides **Play Out**, **AAF Out**, **Archive In**, **Archive Out**, **Import** and **Export** process menus. The desktop (main window) provides an image area that is used to view clips and to display information about the current I/O process. The menu area below the desktop provides setup options applicable to the current I/O process (eg size and format etc).



You can use Marco's I/O Application to perform the following functions:

AAF Out

Projects assembled on the system can be transferred to another platform or workspace using an AAF (Advanced Authoring Format) file. The AAF file references the original source clips using the originator name and source timecode entered when the material was ingested. This allows any other platform to use the AAF file (or converted EDL) to recreate the edited clip.

When an edit is dragged from the Clips Bin and dropped on the desktop in the **AAF Out** menu, an AAF file can be created for future use or for use by another platform that supports the AAF format.

You can convert the current AAF file to an EDL file by pressing the **convert to edl** box. Alternatively drag and drop an AAF file from the bin onto the **convert to edl** button.

Archive In/Out

The I/O application has two archive functions; **Archive In** and **Archive Out**.

Archive Out allows you to store Quantel files and projects including all essence and metadata into a data infrastructure. When you archive a file, the original format is retained including resolution, bit-depth, colour space and frame rate. Files can be archived out to a specified destination using a network, or a local tape.

The **Archive In** function allows you to retrieve and restore files that have been archived. The files are retrieved in their original format. Open the Archive Bin to view archived material.

You can drag archived clips from the Archive Bin and drop them directly onto the desktop or into the Clips Bin which soft-mounts the archives (indicated by yellow bin icons). You can then load the soft-mounted clips on the Edit timeline (indicated by yellow highlights on each segment) where you can edit clips and apply processes to them using MLT FX. Archives can be localised via the desktop, Clips Bin or Edit timeline. By marking in and out points on a timeline clip, you can localise the marked section only.

Import

The **Import** menu is used to import files as stills or sequentially numbered images to form a video clip in the Clips Bin. All files within a sequence must be the same file type, size, aspect ratio, colour depth and resolution.

When file based media is imported or conformed into Marco's workspace, the original network location has its own Clips Bin entry that is separate from originator and source timecode. When clips or images are selected for import, they are displayed on the **Import** desktop area with a preview thumbnail. If you tick group stills into sequences, all selected files are placed on the **Import** desktop as a single entry and saved in the Clips Bin as a clip.

Export

The **Export** menu is used to export any clip(s) from the Clips Bin.

When you drop an unrendered clip onto the desktop in **Export**, a **render** box appears in the menu. It is selected by default if the clip is unrendered. When the box is ticked, the clip is rendered during export. If the clip is unrendered and the box is not ticked, the clip cannot be exported.

See the I/O User Guide for more information about the above functions.

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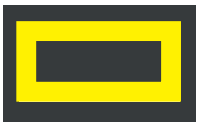
Soft-Mounting & Localising

Soft-Mounting

Soft-mounting allows media to be instantly viewed, edited, and effects can beapplied without having to import the media into the Marco workspace. With Marco, media can be soft-mounted from the **Import** menu, **Archive In** menu and **XDCAM** and **P2** Essence Driver Bins.



Any soft-mounted media is indicated in the Clips Bin with yellow icons. A yellow bar on the Edit or MLT FX timeline indicates where a segment uses remote media.

Soft-mounted clips are displayed at preview resolution and not the full render/localise resolution.

If soft-mounted media is rendered, only the rendered frames are written to the local workspace. If media needs to be re-edited and its history accessed, the original media needs to be available online or the original rushes localised first. Media can be localised from the Clips Bin, Floating Clip or timeline.

Soft-mounting is currently supported for the following formats:

- **ARRI RAW**
- **Canon RAW**
- **CIN**
- **Cinema DNG**
- **DPX**
- **GoPro MP4**
- **MXF-wrapped DNxHD**
- **P2**
- **Quicktime ProRes**
- **RED**
- **Sony F65**
- **SStP**
- **TIFF**
- **XAVC**
- **XDCAM HD**

CPU performance is important when soft-mounting certain files types such as MXF XAVC, MXF XDCAM and RED. The CPU is used to decode the essence. Disk bandwidth is also important when soft-mounting files to provide the compressed data in a timely fashion to the CPU.

Import Menu

If you tick the **soft-mount** box, the media is 'soft-mounted' where it is (SAN, NAS, USB drive etc), instead of importing the media into the Marco workspace.

Archive In

You can drag archived clips from the Archive Bin and drop them directly onto the desktop or into the Clips Bin which soft-mounts the archives (indicated by yellow bin icons). You

can then load the soft-mounted clips on the Edit timeline (indicated by yellow highlights on each segment) where you can edit clips and apply processes using MLT FX.

Play-back performance is varied as it depends on network bandwidth and the source disk performance.

Essence Drivers

The media held on the XDCAM/P2 drive is not automatically transferred to the local storage, but is actually 'soft-mounted' (ie it is decoded and used in its native format from the drive itself). Target clips can be dragged directly from the **XDCAM** or **P2** Bin onto the desktop.

See the I/O User Guide for more information about Soft-Mounting.

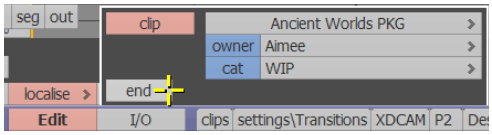
Localising

Before outputting or publishing an edit or effect containing soft-mounted material, it is always recommended that the material is 'localised'. Localising is the process that saves material to the local library in native format. Media can be localised from the Clips Bin, Floating Clip or timeline.

Localised clips appear in the Clips Bin with white icons.

How to Localise

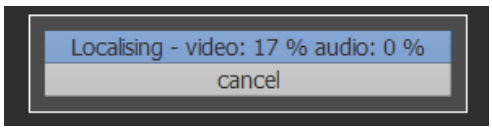
You can localise a whole clip or a selection of the clip by marking in and out points. To localise a Floating Clip, do the following:



1. Press the **localise** box in the bottom-left of the timeline area. The **localise** box can also be located in the **more** menu on a Floating Clip or in the **more** menu in the Clips Bin.

2. A pop-up is displayed allowing the name, owner and category to be entered for the current timeline edit. Enter the relevant details.

3. Press the **end** box to begin localising the clip.



4. A progress indicator (displayed as a percentage) appears during the localisation process. You can press **cancel** at any point to stop the process.

5. The localised version of the clip is saved to the Clips Bin.

See the Timeline Editing User Guide for more information about localising.

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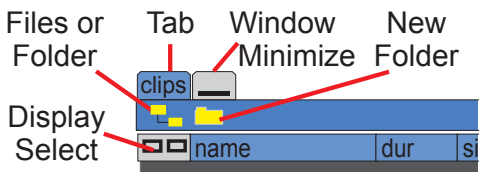
Media Bins

Bins are used to access local and network media libraries. Bins can be used to search for, preview and load material onto the desktop or into available applications. Media can also be saved or published back into the bins.

To open a bin press the corresponding tab on the Application Bar.



You can minimise a bin by pressing the '__' tab at the top-left of the bin. Pressing the <Esc> key shows/hides all minimised bins. To close a bin press the X in the top-right of the bin.

In the bins, clips can be displayed using clip metadata or browse miniatures by pressing on the Display Select icon (see above diagram). Alternatively a combination of both can be displayed by pressing and dragging up or down on the Display Select icon.

Displays clip miniatures and clip metadata

Displays clip miniatures

Displays clip metadata (default character size)

Displays clip metadata (smaller character size)

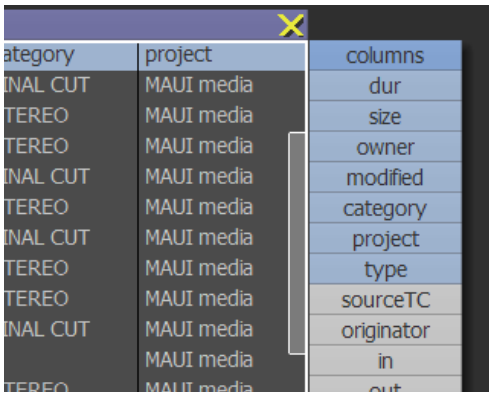
Clips can also be displayed using a folder structure by pressing on the Files or Folder icon (see above diagram). Pressing the 'new folder' icon (see above diagram) creates a new folder.

Folder view

File view

Create new folder

Bin Columns



You can choose which columns are displayed, and in what order, within each bin. The Columns menu can be displayed by hovering the cursor outside the top-right of the bin, pressing **columns** then selecting the column names you require.

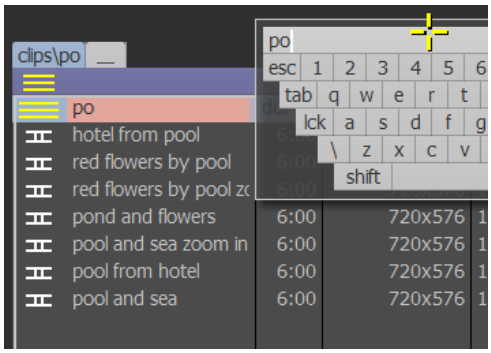
The order in which each column appears in the bin (except the **name** column) can be rearranged horizontally by dragging the column title box to a new position.

Searching Bins

Any column can be used to define a search. To search a column by name, do the following:

1 Select the blue **name** box at the top of the clip title column.

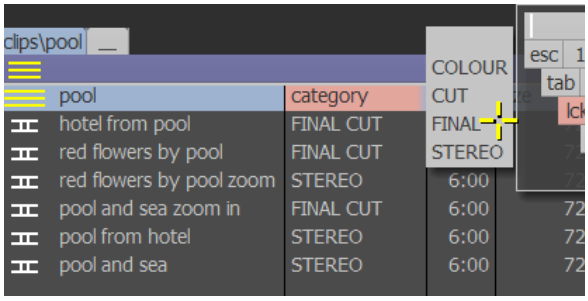
2 A soft keyboard appears. Type the required clip name using either this or the external keyboard and press **end** or <Enter>.

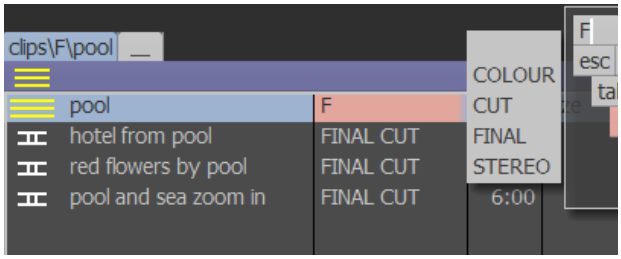


The search is not case sensitive.

The system filters the bin's contents in real time as you type.

3 You can use additional columns to filter the contents further, until you locate the desired clip(s).





4 To clear all search filters, double-click on the bin's name tab (eg **clips**).

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Wildcards

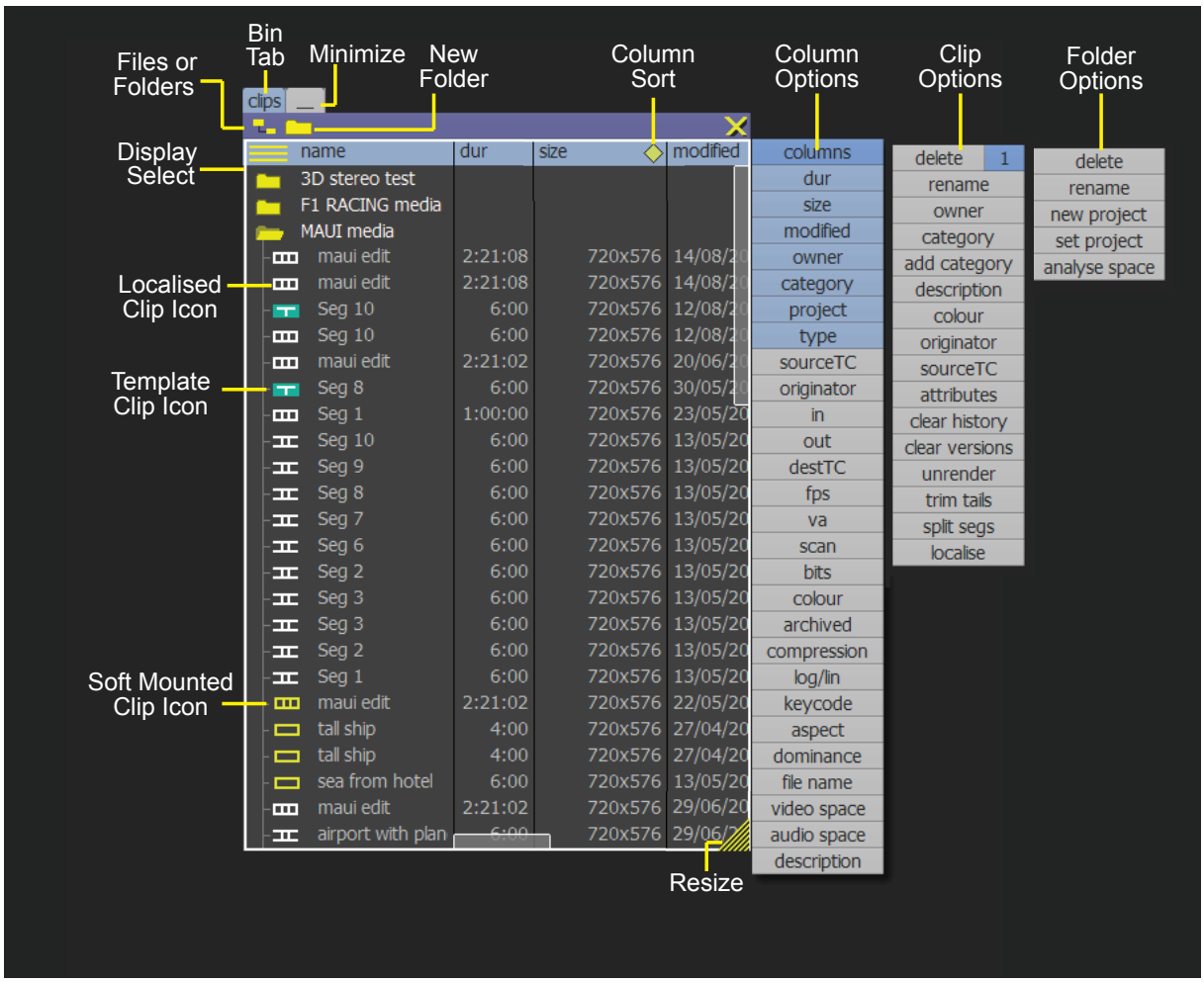
Wildcards can be used to aid the searching process.

Wildcard	Description
&	When you type two or more keywords separated by an ampersand (&) it searches for corresponding words either of which appear in the title. For example, typing PRESIDENT & AIRPORT finds President Arrives at Airport and also finds London's Third Airport.
?	'?' is a single character wildcard, for example ?ART finds Cart but not Art or Start.
*	'*' is a multiple character wildcard, for example *ART finds Art, Cart, Start, Starter and Artwork. '*' wildcards can be used before and after characters, for example *Art* finds Start, Starter, Party etc.

Clips Bin

The Clips Bin stores remotely held and local video, audio and settings clips. You can use it for moving clips between different applications and processes.

The content of the Clips Bin can be displayed as titles, browse miniatures or information cards. The display can be changed by pressing the 'display select' button in the top-left corner of the bin.



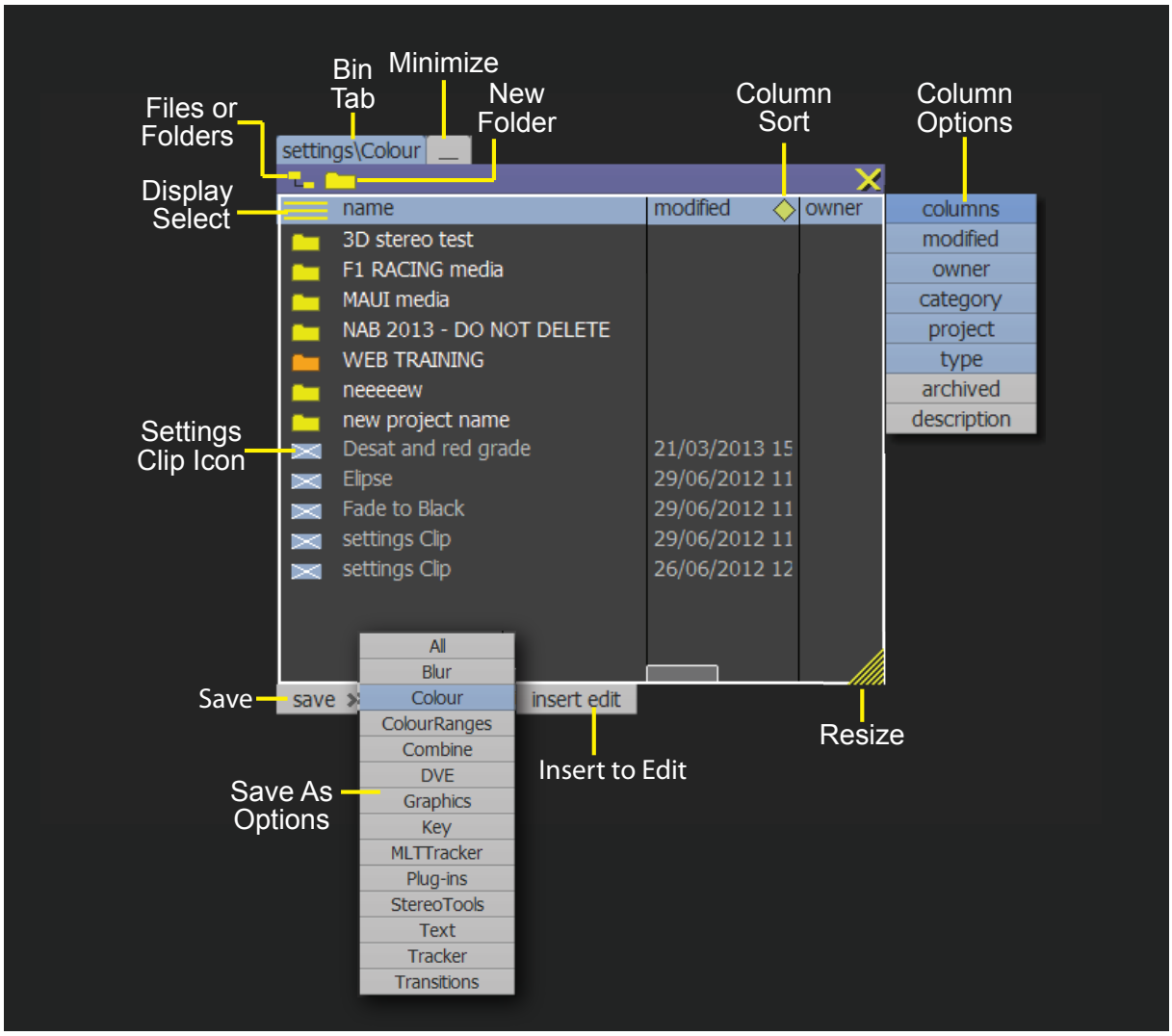
Settings Bin

Although the Settings Bin does not manage media itself, you can use it to transfer parameters between projects.

The settings you can save depend on the current application and menu, eg MLT FX has different Settings Bin options to Edit.

A saved setting has a bin icon that is blue with a white cross.

A saved setting is also saved into the Clips Bin.



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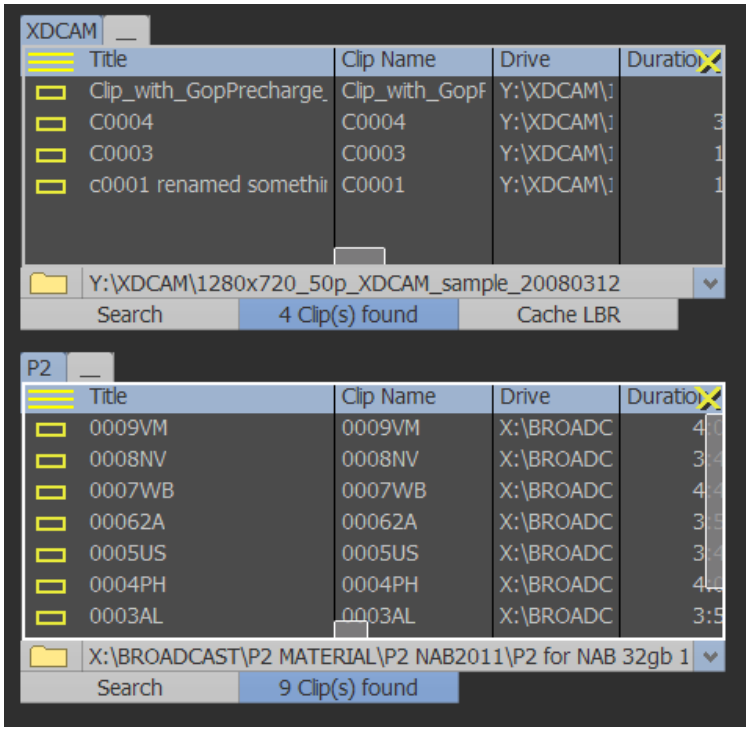
Essence Drivers

XDCam and P2 cards are supported via 'Essence Driver' technology. On the Application Bar there is an **XDCAM** bin and a **P2** bin. These can be used to access XDCAM and P2 material. XDCAM and P2 material can be soft-mounted on the Marco. Soft-mounted XDCAM and P2 content is not moved from the XDCAM/P2 device into the Marco workspace until localised.

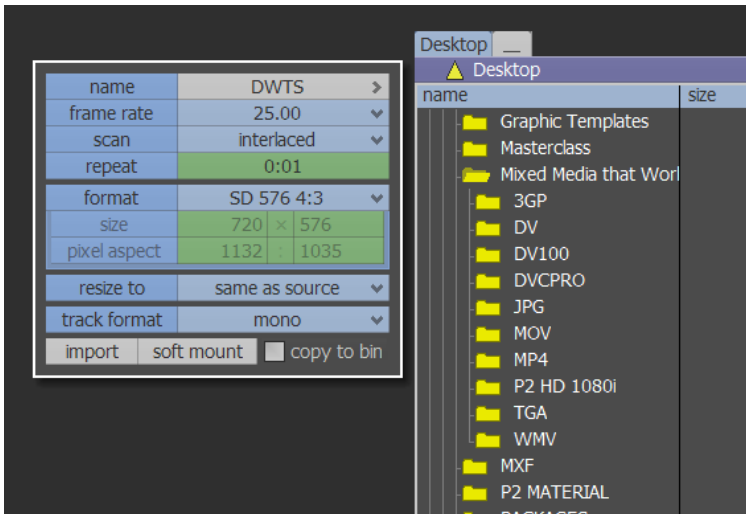


XDCAM and P2 material can be mixed with clips from the local Clips Bin and other remotely held clips. Multiple clips can be streamed simultaneously from the source drives for use in a multilayer timeline. When using multiple streams of HD material the required disk or network bandwidth can be too high to achieve real time playback. To overcome this, it is advised that you localise the material.

The XDCAM/P2 Essence Drivers are designed to work with any XDCAM/P2 drive connected directly to the PC via USB or iLink, with the appropriate FAM (File Access Mode) ProDisc driver.

Desktop Bin

The Desktop Bin can be used to access media that is not held in Marco workspace via the platform's network directories.

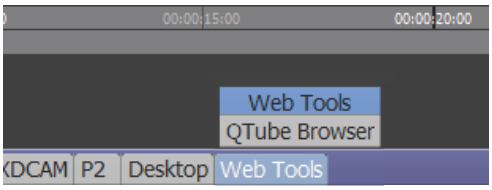


Files from the Desktop Bin can be imported or soft-mounted by dragging and dropping them onto the desktop which displays a pop-up (see screen shot).

In the pop-up you can add a name and configure the frame rate, scan, repeat, size, and pixel aspect. Set the options required, then press import. A Floating Clip now appears on the desktop.

See the Media Bins User Guide for more information about Media Bins and how to use them.

Web Tools

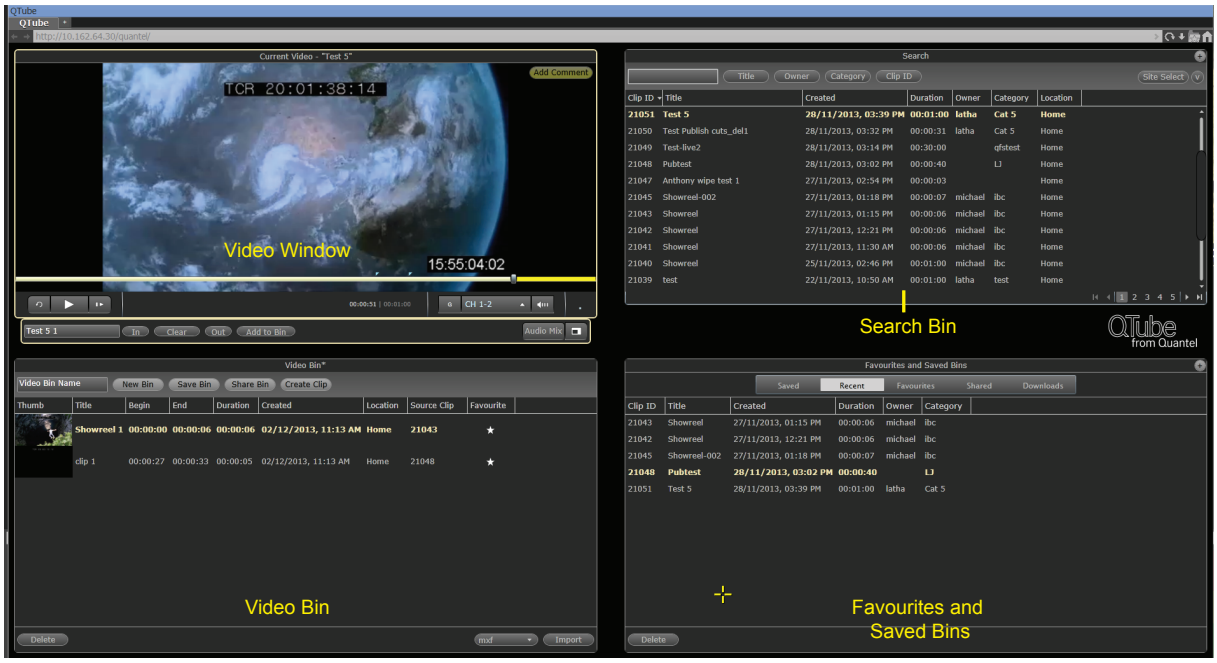


The **Web Tools** tab on the Application Bar opens an embedded web browser. It provides instant and in-application access to a preset range of web addresses. The range of websites available is configurable by system administrators in an XML file.

The location of the XML configuration file is determined by the **Browser Settings** option in the Quantel Settings menu. The **Web Tools** tab is intended to provide quick and easy access to web-based applications such as QTube Browser.

QTube Browser

Web Tools allows Marco to host QTube Browser as an embedded web page. It can be used to locate and download content from a remote Enterprise sQ system that is equipped with QTube. The QTube Browser can be used in exactly the same way as described in the QTube Installation and User Guide. The only difference is that instead of having a **Download** button in the **Video Bin**, there is an **Import** button.



Workflow Example

To use Qtube Browser via the Web Tools feature, do the following:

1. Ensure that the correct IP address for the QTube Transformer has been entered into the Web Tools XML file. (see Web Tools Chapter 1).
2. Select the **Web Tools** tab from the Marco's Application Bar.
3. Select **QTube Browser** from the **Web Tools** list. An embedded browser window opens within the Marco software.

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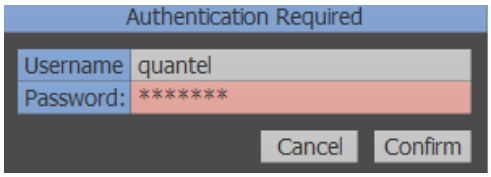
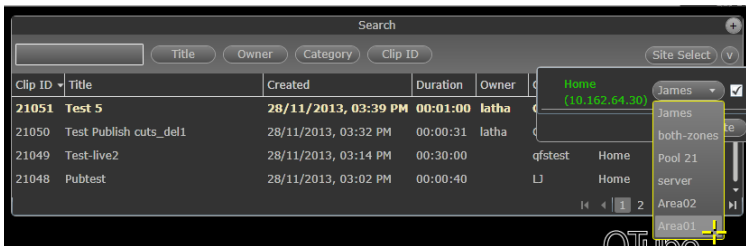


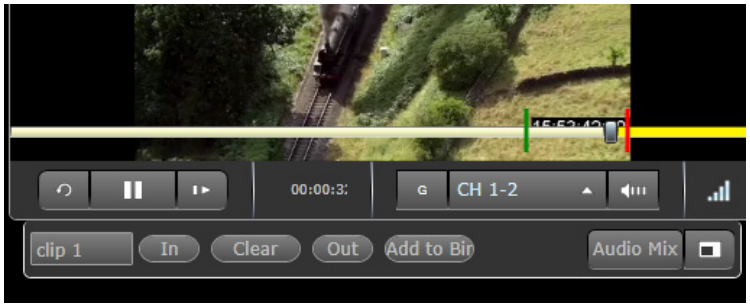
4 A pop-up appears asking you to enter a username and password. Enter the relevant credentials to access the QTube Browser.



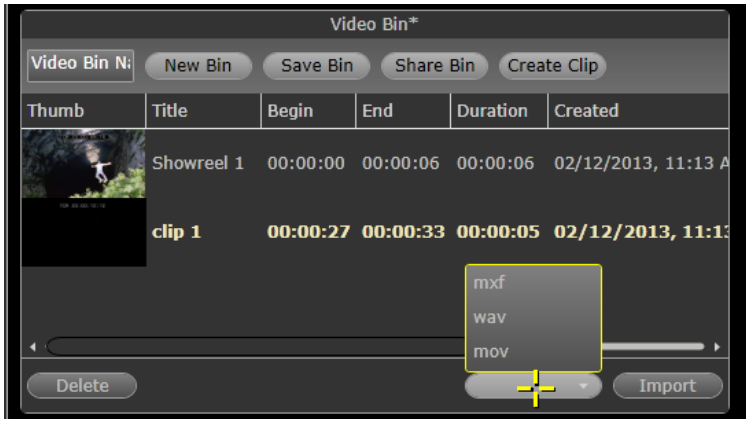
5 Use the **Search** bin to select the server you want to search by pressing **Site Select** in the top-right of the window and then selecting an Area from the pop-up, eg **Area01**.

6 Use the **Search** Bin to perform a search of the chosen server.

7 Play-back a clip in the Viewer window by double-clicking on the clip title.



8 Press **Add to Bin** in the Viewer window to add the currently loaded clip to the **Video Bin** window. Alternatively mark a section of the clip using the **In** and **Out** buttons in the Viewer window.



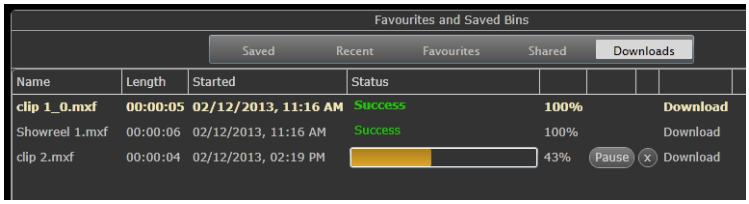
9 Select the clip from the **Video Bin** window.

10 Select **mxf**, **mov** or **wav** from the format drop-down list in the bottom-right of **Video Bin** window.

11 Press **Import**. A pop-up appears asking you to re-enter your credentials.

Upon pressing the **Import** button the clip is downloaded into the Marco PC's **My Documents** folder and then soft-mounted into the Marco software automatically. This means that the clip remains online when Marco is disconnected from the network and taken on the road.

The first time a the import feature is used a credentials box will popup behind the main Marco interface. The user will need to reenter their credentials. This should only happen the first time and then the credentials will be saved.



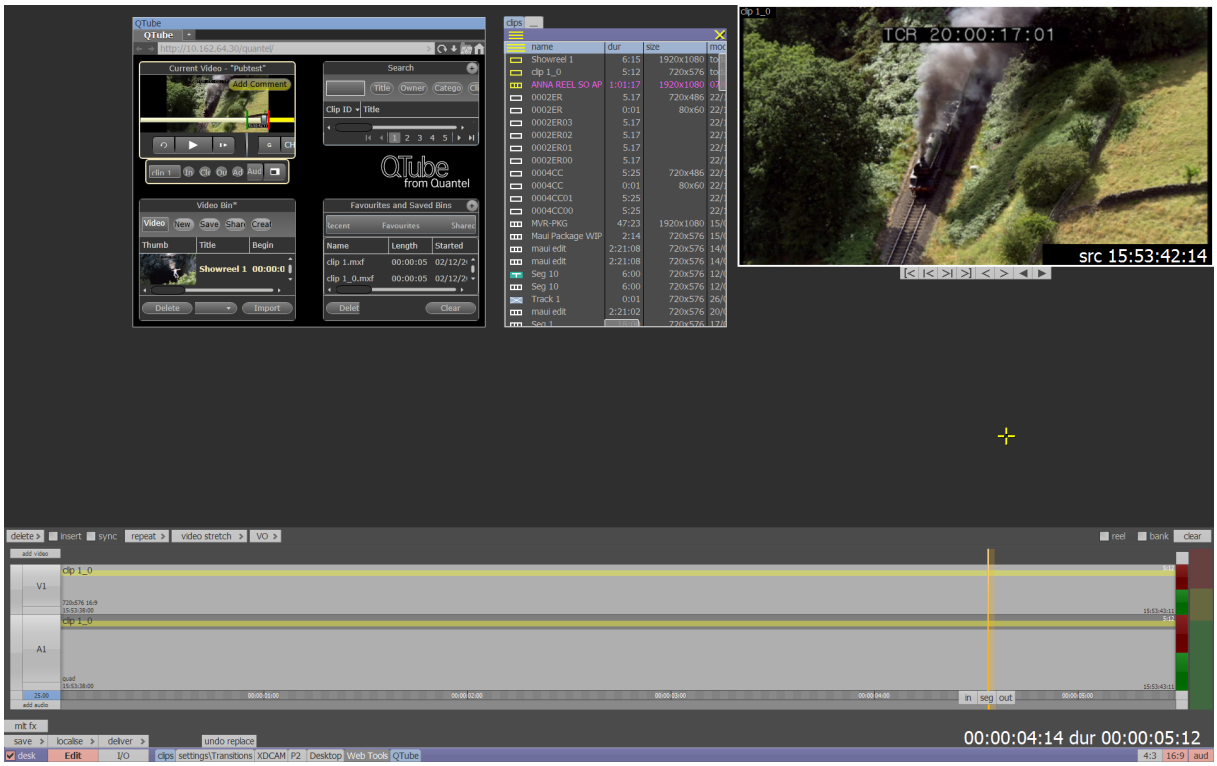
The **Downloads** tab in the Qtube Browser allows you to monitor the progress of the download.

Clips are displayed with metadata and a progress bar showing the status of the download. As well a progress bar there is also a percentage column that allows you to see the progress of your download as a percentage. Once the download is complete the status is displayed as **Success**.

If **mxf** is selected as the file format then the clip is presented soft-mounted in the Marco Clips Bin immediately. This is whilst the import to **My Documents** is still in progress.

If **mov** is selected as the file format then the clip is only be shown soft-mounted in the Marco Clips Bin once the file has finished importing into the **My Documents** folder.

It is possible to select to download clips as wav files although these are not soft-mounted.



See the QTube Installation and User Guide for more information about the QTube Browser.

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Appendices

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Appendix A

Keyboard Shortcuts

Shortcuts marked with an '*' do not work when MLT FX is open.

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Configuration Window

Keyboard Shortcut	Function
<F1>	Opens/closes the Configuration Window.

Layout

Keyboard Shortcut	Function
<F3>	Displays/hides the default safe area in the Edit Window.
<Ctrl>+<⇧>+<Home>	Switches to 'default layout', which forces the following actions: Launch Edit application; clear timeline; close MLT FX; delete all Floating Clips; remove copies of Server Bin (but not original); dock Server Bin with Clips Bin; focus on Server Bin; move bins to top-left of desktop and resize to 35% of screen width; change bin view to 'title' (ie not 'browse'); clear clips docked to Edit Window.

Editing

Keyboard Shortcut	Function
<Tab>	Toggles focus between the timeline and the Floating Clip.
<Ctrl>+<⇧>+<F>	Switches focus to timeline.
<Alt>+<Return>	Performs single clear of timeline: press twice to double clear the timeline (ie resets timeline horizontal/vertical scale, number of tracks, and default frame rate as set in the <F1> Configuration Window's **Fps** drop-down).
< ` >	Toggles the video track filter (**V1**) on/off on the timeline or Floating Clip, depending on current focus.*
<Ctrl>+<A>	Toggles the video and audio track filters on/off on the timeline or Floating Clip, depending on current focus.*
< \ >	Displays the yellow 'Move' menu.*
<Return>	If a Floating Clip or a Clips Bin clip is selected, pressing this key (press twice for Clips Bin clip) places the clip on the timeline at the current timeline cursor position overwriting any overlapping media. If **insert** is ticked (or the <Insert> key pressed), the existing media is split and moves along the timeline accordingly (referred to as 'insert edit'). If **sync** is ticked, a Floating Clip can be placed onto the timeline with its cursor point matching the cursor point on the timeline clip.
<Ctrl>+<Return>	Performs an 'insert edit' regardless of whether the **insert** function is enabled or disabled (see previous <Return> shortcut).
<Insert>	Toggles the GUI **insert** function (ie 'insert edit') on/off.*
<Alt>+<Y>	Toggles the GUI **sync** function on/off.*
<H>	Inserts a edit point at the current timeline cursor position.

Keyboard Shortcut	Function
<M>	Selects Match Frame mode.*
<Q>	Jumps to the currently selected in point.
<W>	Jumps to the currently selected out point.
<E>, <I>	Marks an in point at the current timeline cursor position.
<R>, <O>	Marks an out point at the current timeline cursor position.
<T>	Marks the current segment selected by the current timeline cursor position.
<D>	Clears the currently assigned in point.
<F>	Clears the currently assigned out point.
<G>	Clears the currently selected segment.
<Z>	Allows the current segment on the timeline to be lifted.* (in MLT FX this toggles zoom levels).
<P>	Extends the end of a clip segment from its current position to the current timeline cursor position.*
<C>	Placing the timeline cursor on an edit point then pressing this key trims back 10 frames from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
<V>	Placing the timeline cursor on an edit point then pressing this key trims back 1 frame from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
<B>	Placing the timeline cursor on an edit point then pressing this key trims forward 1 frame from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
<N>	Placing the timeline cursor on an edit point then pressing this key trims forward 10 frames from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
< [>	Placing the timeline cursor after an edit point then pressing this key trims (ie 'tops') the start of the clip segment to the current frame.
<] >	Placing the timeline cursor before an edit point then pressing this key trims (ie 'tails') the end of the clip segment to the current frame.
<F2>	Displays/hides the paint palette which allows colours to be selected and mixed.
<F8>	Shows/hides the optional one shot image corrector menu.*
<F9>	Selects Match Frame mode.*

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Keyboard Shortcut	Function
<F5>, <Y>	Displays the Video Transition Menu that allows a cut, dissolve, wipe or custom transition to be selected. The actual settings used for the wipe, dissolve or custom transition (eg a wipe shape and its position about the edit point) are those previously set in the Trim/Transition Window (see later in this chapter); but these can be changed as required.
<Alt>+<Insert>	Solos the upper selected video and audio track.
<Alt>+<Delete>	Mutes/un-mutes selected video and audio tracks.
<Alt>+<V>	Shows/hides voice over GUI functions.*
<Alt>+<B>	Starts/stops voice over recording.*
<Alt>+<S>	Opens the timeline **save** pop-up: press twice to save current clip to Clips Bin.
<Alt>+<T>	Toggles between **save** pop-up's **clip** and **storyboard** boxes.*
<Alt>+<X>	Closes the **save** pop-up without saving the clip.

Audio

Keyboard Shortcut	Function
< / >	Inserts an audio node.*
<F6>, <U>	Displays the Audio Transition Menu.*
<F7>	Displays the Audio Information Menu.*
<1>	Depending on focus, this toggles the timeline or Floating Clip audio track filter (A1) on/off.*
<2>	Depending on focus, this toggles the timeline or Floating Clip audio track filter (A2) on/off.*
<3>	Depending on focus, this toggles the timeline or Floating Clip audio track filter (A3) on/off.*
<4>	Depending on focus, this toggles the timeline or Floating Clip audio track filter (A4) on/off.*
<Scroll Lock >	Turns on the audio scrub play-out mode that changes the pitch of the audio to match the speed at which the clips are played or re-wound. With Scroll Lock turned off, audio snippet play-out mode is used.*
<Ctrl>+<A>	Depending on focus, this toggles the video and audio track filters on/off on the timeline or Floating Clip.*
<Alt>+<1>	Toggles the MLT FX timeline audio track filter (A1) on/off.
<Alt>+<2>	Toggles the MLT FX timeline audio track filter (A2) on/off.
<Alt>+<3>	Toggles the MLT FX timeline audio track filter (A3) on/off.
<Alt>+<4>	Toggles the MLT FX timeline audio track filter (A4) on/off.
<Alt>+<Insert>	Solos the upper selected video and audio track.

Keyboard Shortcut	Function
<Alt>+<Delete>	Mutes/un-mutes selected video and audio tracks.

Navigation & Playback

Keyboard Shortcut	Function
<Space Bar>	Starts/stops playing the clip edit currently on the timeline.
<→>	Steps the current frame position on the timeline clip forwards 1 frame.
<⇧>+<→>	Moves forward 10 frames.*
<Ctrl>+<→>	Moves forward 1 second.*
<Ctrl>+<⇧>+<→>	Jumps to last frame.*
<←>	Steps the current frame on the timeline clip backwards 1 frame.
<⇧>+<←>	Moves back 10 frames.*
<Ctrl>+<←>	Moves back 1 second.*
<Ctrl>+<⇧>+<←>	Jumps to first frame.*
<↓>, <S>, < ‘ >	Steps the current frame on the timeline to the next edit point (or next logged event)
<↑> ,<A>, < ; >	Steps the current frame on the timeline to the previous edit point (or previous logged event).
<J>, < , >	Plays the clip backwards from the current frame on the timeline. Repeated presses increase the speed by 1, 2, 4, 8, 16 or 32 frames.
<K>	Pauses the playing clip.
<L>, < . >	Plays the clip forwards from the current frame on the timeline. Repeated presses increase the speed by 1, 2, 4, 8, 16 or 32 frames.
<5>	Plays the clip forwards at normal speed.
<6>	Plays the clip forwards at normal speed from the currently selected in point to the currently selected out point.
<7>	Jogs backwards 10 frames through the clip from the current frame on the timeline.
<8>	Jogs backwards 1 frame through the clip from the current frame on the timeline.
<9>	Jogs forwards 1 frame through the clip from the current frame on the timeline.
<0>	Jogs forwards 10 frames through the clip from the current frame on the timeline.
<Home>	Jumps to the first frame on the timeline.
<Page Up>	Zooms-in on the timeline around the current frame. Repeated presses increase the zoom.
<End>	Jumps to the last frame on the timeline.

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Keyboard Shortcut	Function
<Page Down>	Zooms-out on the timeline around the current frame. Repeated presses decrease the zoom.

Undo & Redo

Keyboard Shortcut	Function
<Ctrl>+<Z>	undoes the last operation.
<Ctrl>+<R>	redoes the last operation that was undone.

Bins

Keyboard Shortcut	Function
<Alt>+<←>	moves focus left on nested Clips/Server Bins.
<Alt>+<→>	moves focus right on nested Clips/Server Bins.
<Esc>	hides/shows all open media bins on the desktop.
<F4>	refreshes the Server Bin.
<Ctrl>+<↑>, <↓>	moves Server Bin clip selector.
<Ctrl>+<⇧>+<B>	switches focus to Server Bin.
<Ctrl>+<⇧>+<S>	selects Server Bin 'Areas' scroll box.
<Ctrl>+<⇧>+<T>	shows Server Bin clip naming pop-up (ie soft keyboard).
<Ctrl>+<Return>	shows selected Server Bin clip docked to Edit Window.
<Ctrl>+<⇧>+<Return>	shows Server Bin clip docked to Edit Window with history.*
<Ctrl>+<C>	copies a clip that is highlighted in the server bin to the local clips bin.

* Shortcut does not work when MLT FX is open.

Appendix B

About This Manual

This guide covers software available on some Quantel stand-alone and server-connected systems. It may cover functions or options not available on the system you are using.

This guide was written and published by Quantel. The bottom of each page displays the guide's reference number, eg **2140-57-018** plus a revision letter, eg **B** (B being more recent than A which is the original). The publish date is also indicated in the format **mm/yy**. If you require hard copies of this guide, always quote the reference number, revision letter and title.

2141-57-013 revision	**publish date**	*ECO (Quantel use only)*	**software version**
A	**Dec 13**	**E45103**	**V5.3**

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Notices

Maintenance

WARNING (WM2) SERVICE PERSONNEL – MAINTENANCE AND CALIBRATION WITHIN THE EQUIPMENT ENCLOSURE IS ONLY TO BE CARRIED OUT BY SERVICE PERSONNEL (12/97)

Conventions Used

Symbols

See: Reference to other items in this document or in other documents.

Notes: System, software and workflow points to consider and remember.

Tips: Useful hints and advice when undertaking tasks.

Information: Additional hardware or software information which may be useful.

Cautions: Indicate possible damage to (or misalignment of) the equipment if the indicated statements are ignored or the indicated procedures are not followed correctly.

WARNINGS: INDICATE DANGER TO LIFE AND LIMB IF THE INDICATED STATEMENTS ARE IGNORED, OR THE INDICATED PROCEDURES ARE NOT FOLLOWED CORRECTLY.

Text

<Text>	indicates a specific key press on the QWERTY keyboard.
NN/nn	indicates a value entered on a numeric keypad.
Text/text	indicates either a Quantel control panel function or a Windows/Quantel installation/system setting.

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This manual is not product specific and may detail features that are not available on all systems.

Helpdesk & Web Support

24 Hour Helpdesk

tel +44 (0)1635 38508* *fax* +44 (0)1635 815892
email 24hour.support@quantel.com

Website & Downloads (manuals, drivers, plug-ins & software)

http://www.quantel.com go to support–downloads (login required)

* calls may be recorded for training & quality control purposes.

NUGEN VisLM Plug-in

A license is required to run the NUGEN VisLM. Quantel customers should purchase licenses direct from NUGEN Audio by either:

a Purchasing the product from their online shop, clicking the hot-link within NUGEN VisLM itself.

b Making a purchase from an authorised reseller.

Any support or licensing issues relating to NUGEN VisLM should be directed to NUGEN customer support:

http://www.nugenaudio.com/support.php

http://nugenaudio.com/licensing.php

Or by emailing:

support@NUGENaudio.com

Appendices

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